

Observations of Occultations of Stars and Uranus by the Moon, and of Phenomena of Jupiter's Satellites,  
made at the Royal Observatory, Greenwich, in the year 1885.

(Communicated by the Astronomer Royal.)

Occultations of Stars and Uranus by the Moon.

| Day of Obs.       | Phenomenon. | Telescope.       | Power.        | Moon's<br>Limb. | Mean Solar<br>Time of<br>Observation. |    |       | Observer. |
|-------------------|-------------|------------------|---------------|-----------------|---------------------------------------|----|-------|-----------|
|                   |             |                  |               |                 | h                                     | m  | s     |           |
| 1885, Feb. 20 (a) | Disapp.     | 38 Arietis       | Simms' Eq.    | 220             | 7                                     | 40 | 37.53 | H. T.     |
|                   | "           | 38 Arietis       | Altaz         | 100             | 7                                     | 40 | 37.57 | A. D.     |
|                   | "           | 38 Arietis       | E. Eq.        | 70              | 7                                     | 40 | 37.59 | H.        |
|                   | "           | 130 Tauri        | Altaz         | 100             | 11                                    | 2  | 21.94 | H. T.     |
|                   | "           | 130 Tauri        | E. Eq.        | 140             | 11                                    | 2  | 21.54 | T.        |
| Mar. 22           | "           | W. B. (2) V. 445 | Simms' Eq.    | 220             | 6                                     | 48 | 38.77 | H. T.     |
|                   | "           | 111 Tauri        | "             | "               | 6                                     | 51 | 33.07 | "         |
|                   | "           | 111 Tauri        | Altaz         | 100             | 6                                     | 51 | 32.54 | T.        |
|                   | "           | 111 Tauri        | E. Eq.        | 210             | 6                                     | 51 | 32.44 | H.        |
|                   | "           | 117 Tauri        | Lassell Refl. | 250             | 9                                     | 2  | 33.95 | W. C.     |
|                   | "           | 117 Tauri        | Simms' Eq.    | 220             | 9                                     | 2  | 34.37 | H. T.     |
|                   | "           | 117 Tauri        | Altaz         | 100             | 9                                     | 2  | 34.01 | T.        |
|                   | "           | B. F. 1464       | Lassell Refl. | 250             | 10                                    | 23 | 28.61 | H. T.     |
|                   | "           | B. F. 1464       | Simms' Eq.    | 220             | 10                                    | 23 | 28.15 | C.        |
|                   | "           | 43 Leonis        | Altaz         | 100             | 11                                    | 36 | 26.08 | H. T.     |
| 27 (b)            | "           | 43 Leonis        | Simms' Eq.    | 220             | 11                                    | 36 | 25.72 | C.        |
|                   | "           | 43 Leonis        | E. Eq.        | 210             | 11                                    | 36 | 25.98 | A. D.     |

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| Day of Obs.       | Phenomenon. | Telescope. | Power. | Moon's Limb. | Mean Solar Time of Observation. | Observer. |
|-------------------|-------------|------------|--------|--------------|---------------------------------|-----------|
| 1885. Mar. 28 (d) | Disapp.     | E. Eq.     | 210    | Dark         | h m s<br>10 18 40.00            | T.        |
| 28                | "           | Simms' Eq. | 220    | "            | 12 13 38.84                     | H. T.     |
| 28                | "           | E. Eq.     | 210    | "            | 12 13 38.14                     | T.        |
| 28                | "           | Altaz      | 100    | "            | 12 13 38.54                     | L.        |
| 31 (e)            | Reapp.      | "          | "      | Bright       | 10 27 50.47                     | W. C.     |
| Apr. 20 (f)       | Disapp.     | Simms' Eq. | 220    | Dark         | 10 26 2.72                      | H. T.     |
| 20                | "           | "          | "      | "            | 10 58 57.73                     | "         |
| 20                | "           | Altaz      | 100    | "            | 10 58 57.44                     | T.        |
| 20                | "           | E. Eq.     | 210    | "            | 10 58 57.62                     | L.        |
| 20 (g)            | Reapp.      | Simms' Eq. | 220    | Bright       | 11 20 18.73                     | H. T.     |
| 20 (h)            | "           | Altaz      | 100    | "            | 11 20 25.32                     | T.        |
| 20 (i)            | "           | E. Eq.     | 210    | "            | 11 20 22.82                     | L.        |
| July 20 (j)       | Disapp.     | Altaz      | 100    | Dark         | 10 57 0.92                      | H.        |
| 22                | "           | "          | "      | "            | 10 31 57.29                     | A. D.     |
| 22                | "           | E. Eq.     | 210    | "            | 10 31 56.99                     | H.        |
| Aug. 20           | "           | "          | "      | "            | 11 38 47.25                     | "         |
| Sep. 1            | Reapp.      | "          | "      | "            | 10 51 57.27                     | H. T.     |
| 1 (k)             | "           | Altaz      | 100    | "            | 10 51 57.41                     | S. D.     |
| 1                 | "           | E. Eq.     | 70     | "            | 11 32 17.14                     | H. T.     |
| 1 (k)             | "           | Altaz      | 100    | "            | 11 32 17.01                     | S. D.     |
| 1                 | "           | E. Eq.     | 70     | "            | 12 0 33.25                      | H. T.     |

| Day of Obs.                | Phenomenon. | Telescope.    | Power. | Moon's<br>Limb. | Mean Solar<br>Time of<br>Observation.<br>h m s | Observer. |
|----------------------------|-------------|---------------|--------|-----------------|------------------------------------------------|-----------|
| 1885, Sep. 19 ( <i>k</i> ) | Disapp.     | E. Eq.        | 210    | Dark            | 8 4 9.90                                       | A. D.     |
| 20                         | "           | "             | "      | "               | 6 48 32.71                                     | H. T.     |
| 21                         | "           | Simms' Eq.    | 220    | "               | 10 7 44.97                                     | A. D.     |
| 25 ( <i>l</i> )            | "           | E. Eq.        | "      | Bright          | 8 11 25.50                                     | L.        |
| Oct. 1 ( <i>k</i> )        | "           | Altaz         | 100    | "               | 12 38 14.33                                    | A. P.     |
| 1 ( <i>k</i> )             | "           | E. Eq.        | 210    | "               | 12 38 16.22                                    | R. W.     |
| Nov. 17                    | "           | "             | "      | Dark            | 10 40 37.17                                    | L.        |
| 30                         | "           | "             | 70     | Bright          | 16 59 34.75                                    | "         |
| 30 ( <i>m</i> )            | "           | "             | "      | "               | 16 59 35.55                                    | "         |
| 30                         | Reapp.      | "             | "      | Dark            | 18 9 26.17                                     | "         |
| 30 ( <i>n</i> )            | "           | "             | "      | "               | 18 9 27.07                                     | "         |
| Dec. 28 ( <i>l</i> )       | Disapp.     | Altaz         | 100    | Bright          | 16 5 38.55                                     | J. P.     |
| 28 ( <i>o</i> )            | Reapp.      | Lassell Refl. | 350    | Dark            | 17 14 50.76                                    | H. T.     |
| 28                         | "           | Altaz         | 100    | "               | 17 14 46.40                                    | J. P.     |

## Notes.

- (*a*) Disappearance instantaneous.  
(*c*) Observation doubtful owing to difficulty in keeping the faint star steadily in view; telescope shaken by wind.  
(*d*) Star very faint; Moon very bright.  
(*f*) Angle from vertex about 70°; star 6th or 7th magnitude.  
(*h*) Probably late.  
(*j*) Star very faint; observation considered unsatisfactory.  
(*l*) Limb very unsteady.  
(*n*) Dark limb of Moon very distinct.
- (*b*) Star much fainter than expected.  
(*e*) Observation doubtful, star's light overpowered by that of the Moon.  
(*g*) Reappearance instantaneous.  
(*i*) Observation good.  
(*k*) Cloudy.  
(*m*) The planet seemed to take about 1 sec. to disappear.  
(*o*) Probably too late; the star reappeared very near the edge of the field.

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Phenomena of Jupiter's Satellites.

| Day of Obs.      | Satellite. | Phenomenon.            | Telescope. | Power. | Mean Solar<br>Time of<br>Observation.<br>h m s | Mean Solar<br>Time of<br>N.A.<br>h m s | Observer. |
|------------------|------------|------------------------|------------|--------|------------------------------------------------|----------------------------------------|-----------|
| 1885, Jan. 4 (a) | III.       | Occ. D. First contact  | E. Eq.     | 140    | 11 22 36                                       | 11 25                                  | L.        |
|                  |            | Last seen              | "          | "      | 11 28 11                                       |                                        |           |
|                  | III.       | Occ. R. Bisection      | "          | "      | 14 59 36                                       | 15 0                                   | H. T.     |
|                  | IV.        | Tr. Ing. First contact | Simms' Eq. | 220    | 14 1 1                                         |                                        |           |
| 8 (b)            |            | Bisection              | "          | "      | 14 4 46                                        | 14 12                                  | L.        |
|                  |            | Last contact           | "          | "      | 14 6 41                                        |                                        |           |
|                  |            | First contact          | E. Eq.     | 140    | 14 1 20                                        |                                        |           |
|                  |            | Bisection              | "          | "      | 14 4 19                                        |                                        |           |
| 20 (c)           | IV.        | Last contact           | "          | "      | 14 6 49                                        | 18 43                                  | H. T.     |
|                  |            | Tr. Egr. Last contact  | Simms' Eq. | 220    | 18 50 42                                       |                                        |           |
|                  | II.        | Occ. R. Bisection      | "          | "      | 11 14 8                                        |                                        |           |
|                  |            | Last contact           | "          | "      | 11 15 53                                       |                                        |           |
| 25 (d)           |            | First seen.            | E. Eq.     | 210    | 11 13 35                                       | 11 15                                  | T.        |
|                  |            | Last contact           | "          | "      | 11 14 50                                       |                                        |           |
|                  | IV.        | Tr. Egr. First contact | "          | "      | 9 28 55                                        | 9 40                                   | A. D.     |
|                  |            | Last contact           | "          | "      | 9 37 24                                        |                                        |           |
| 27               |            | Last contact           | Simms' Eq. | 220    | 9 37 56                                        | 13 33                                  | L.        |
|                  |            | Occ. R. First seen     | E. Eq.     | 140    | 13 30 37                                       |                                        |           |
|                  | II.        | Last contact           | "          | "      | 13 34 51                                       |                                        |           |
|                  |            |                        |            |        |                                                |                                        |           |

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| Day of Obs.       | Satellite. | Phaenomenon.           | Telescope. | Powe | Mean Solar<br>Time of<br>Observation. | Mean Solar<br>Time of<br>N.A. | Observer. |
|-------------------|------------|------------------------|------------|------|---------------------------------------|-------------------------------|-----------|
| 1885, Jan. 29 (e) | III.       | Tr. Ing. First contact | E. Eq.     | 210  | m s<br>11 16 34                       | h m s<br>11 19                | A.D.      |
|                   | I.         | Tr. Ing. Bisection     | "          | 140  | 12 13 49                              | 12 12                         | J. P.     |
| 3                 | I.         | Last contact           | "          | "    | 12 15 34                              |                               | "         |
|                   | II.        | Occ. R. Last contact   | "          | 210  | 11 42 12                              | 11 41                         | H. T.     |
| (g)               | II.        | Ec. D. Last seen       | "          | "    | 13 8 12                               | 12 9 27                       | "         |
|                   | II.        | Tr. Egr. First contact | "          | "    | 9 59 34                               |                               | B.        |
| 5                 |            | Bisection              | "          | "    | 10 2 48                               | 10 8                          |           |
|                   |            | Last contact           | "          | "    | 10 5 48                               |                               | W. C.     |
| 9 (h)             | III.       | Occ. R. First seen     | Simms' Eq. | 220  | 7 50 57                               |                               | "         |
|                   |            | Bisection              | "          | "    | 7 52 27                               |                               | "         |
| (i)               |            | Last contact           | "          | "    | 7 55 57                               |                               | H. T.     |
|                   |            | First seen             | Altaz      | 100  | 7 51 43                               |                               | "         |
| (j)               |            | Last contact           | "          | "    | 7 58 31                               | 7 53                          | M.        |
|                   |            | First seen             | S.E. Eq.   | 220  | 7 50 3                                |                               | "         |
| (k)               |            | Bisection              | "          | "    | 7 54 8                                |                               | "         |
|                   |            | Last contact           | "          | "    | 7 59 7                                |                               | T.        |
| 11 (l)            | I.         | Tr. Egr. First contact | E. Eq.     | 210  | 7 54 22                               |                               | H. T.     |
|                   |            | Bisection              | "          | "    | 10 37 1                               | 10 41                         |           |
|                   |            | Last contact           | "          | "    | 10 39 40                              |                               |           |
|                   |            |                        | "          | "    | 10 42 50                              |                               |           |

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| Day of Obs.   | Satellite. | Phenomenon.            | Telescope.    | Power. | Mean Solar Time of Observation.<br>h m s | Mean Solar Time of N.A.<br>h m s | Observer. |
|---------------|------------|------------------------|---------------|--------|------------------------------------------|----------------------------------|-----------|
| 1885, Feb. 18 | I.         | Tr. Ing. Last contact  | Simms' Eq.    | 220    | 10 9 48                                  | 10 6                             | "         |
|               |            | First contact          | E. Eq.        | 210    | 10 3 47                                  |                                  | L.        |
|               |            | Bisection              | "             | "      | 10 5 57                                  |                                  | "         |
|               |            | Last contact           | "             | "      | 10 8 16                                  |                                  | "         |
|               |            | Tr. Egr. First contact | "             | "      | 12 21 20                                 |                                  | "         |
| 19 (d)        | I.         | Bisection              | "             | "      | 12 23 44                                 | 12 25                            | "         |
|               |            | Last contact           | "             | "      | 12 25 49                                 |                                  | "         |
|               |            | Ecl. R. First seen     | Lassell Refl. | 145    | 8 44 42                                  |                                  | W. C.     |
|               |            | First seen             | Simms' Eq.    | 220    | 8 45 3                                   |                                  | H. T.     |
|               |            | First seen             | S.E. Eq.      | 310    | 8 44 13                                  |                                  | M.        |
| (m)           | IV.        | Bisection              | "             | "      | 8 49 23                                  | 8 41 52                          | "         |
|               |            | Full brightness        | "             | "      | 8 53 43                                  |                                  | "         |
|               |            | First seen             | E. Eq.        | 210    | 8 46 2                                   |                                  | T.        |
|               |            | First seen             | Altaz         | 100    | 8 45 10                                  |                                  | L.        |
|               |            | Full brightness        | "             | "      | 8 49 9                                   |                                  | "         |
| 23 (o)        | III.       | First contact          | "             | "      | 10 43 10                                 | 10 49                            | H. T.     |
|               |            | Bisection              | "             | "      | 10 47 59                                 |                                  | "         |
|               |            | Last seen              | "             | "      | 10 52 14                                 |                                  | "         |
|               |            | First contact          | E. Eq.        | 70     | 10 43 24                                 |                                  | T.        |
|               |            | Last seen              | "             | 140    | 10 54 7                                  |                                  | "         |
| (o)           |            | First contact          | Simms' Eq.    | 220    | 10 44 24                                 | 10 52 54                         | L.        |
|               |            | Last seen              | "             | "      | 10 52 54                                 |                                  | "         |

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| Day of Obs.             | Satellite. | Phaenomenon.           | Telescope.    | Power. | Mean Solar Time of Observation. | Mean Solar Time of N.A. | Observer. |
|-------------------------|------------|------------------------|---------------|--------|---------------------------------|-------------------------|-----------|
| 1885, Feb. 23 (o)<br>25 | III.       | Ecl. R. First seen     | E. Eq.        | 140    | h m s<br>14 51 58               | h m s<br>14 49 46       | T.        |
|                         | I.         | Tr. Ing. First contact | Lassell Refl. | 170    | 11 47 36                        |                         | H. T.     |
|                         |            | Last contact           | "             | "      | 11 51 51                        |                         | "         |
|                         |            | First contact          | E. Eq.        | 140    | 11 47 51                        | 11 50                   | L.        |
|                         |            | Bisection              | "             | "      | 11 50 6                         |                         | "         |
|                         |            | Last contact           | "             | "      | 11 52 35                        |                         | "         |
|                         | I.         | Tr. Egr. First contact | "             | "      | 14 6 13                         | 14 9                    | "         |
|                         |            | Last contact           | "             | "      | 14 11 42                        |                         | "         |
|                         | I.         | Sh. Egr. First contact | "             | "      | 14 15 12                        | 14 19                   | "         |
|                         |            | Last contact           | "             | "      | 14 18 26                        |                         | "         |
| Mar. 2 (p)              | III.       | Occ. D. First contact  | "             | 210    | 14 3 31                         |                         | H. T.     |
|                         |            | Bisection              | "             | "      | 14 8 40                         | 14 6                    |           |
|                         |            | Last seen              | "             | "      | 14 11 30                        |                         |           |
|                         | I.         | Tr. Ing. First contact | "             | "      | 13 32 5                         | 13 34                   | H.        |
|                         |            | Last contact           | "             | "      | 13 34 28                        |                         |           |
|                         | I.         | Tr. Egr. First contact | "             | "      | 15 49 6                         | 15 54                   | L.        |
|                         |            | Last contact           | "             | "      | 15 54 20                        |                         |           |
|                         | I.         | Sh. Egr. First contact | "             | "      | 16 8 18                         | 16 14                   | "         |
|                         |            | Last contact           | "             | "      | 16 11 18                        |                         |           |
|                         |            |                        | "             | "      |                                 |                         |           |

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| Day of Obs.      | Satellite. | Phenomenon.            | Telescope. | Power. | Mean Solar Time of Observation.<br>h m s | Mean Solar Time of N.A.<br>h m s | Observer. |   |
| 1885, Mar. 7 (e) | I.         | Ecl. R. First seen     | Simms' Eq. | 220    | 7 49 31                                  | 7 49 4                           | L.        | } |
|                  |            | Full brightness        | "          | "      | 7 52 23                                  |                                  | "         |   |
|                  |            | First seen             | E. Eq.     | 210    | 7 51 21                                  |                                  | A. P.     |   |
|                  |            | Full brightness        | "          | "      | 7 54 21                                  |                                  | "         |   |
| 14               | I.         | Ecl. R. First seen     | "          | "      | 9 43 28                                  | 9 43 20                          | A. D.     | } |
|                  |            | Full brightness        | "          | "      | 9 45 35                                  |                                  | "         |   |
|                  |            | First contact          | "          | "      | 13 17 30                                 |                                  | "         |   |
|                  |            | Last seen              | "          | "      | 13 21 59                                 |                                  | "         |   |
| 16               | II.        | Tr. Egr. First contact | T. C.      | 200    | 10 23 57                                 | 10 24                            | S. D.     | } |
|                  |            | Tr. Ing. First contact | E. Eq.     | 210    | 10 20 25                                 |                                  | T.        |   |
|                  |            | Bisection              | "          | "      | 10 24 40                                 |                                  | "         |   |
|                  |            | Last contact           | "          | "      | 10 29 54                                 |                                  | "         |   |
| 20 (r)           | III.       | First contact          | Simms' Eq. | 220    | 10 19 16                                 | 10 24                            | H.        | } |
|                  |            | Bisection              | "          | "      | 10 23 40                                 |                                  | "         |   |
|                  |            | Last contact           | "          | "      | 10 28 26                                 |                                  | "         |   |
|                  |            | First contact          | E. Eq.     | 210    | 11 28 39                                 |                                  | T.        |   |
| (r)              | I.         | Tr. Ing. First contact | "          | "      | 11 31 29                                 | 11 31                            | "         | } |
|                  |            | Bisection              | "          | "      | 11 34 13                                 |                                  | "         |   |
|                  |            | Last contact           | "          | "      | 13 47 26                                 |                                  | H. T.     |   |
|                  |            | First contact          | Simms' Eq. | 220    | 13 51 46                                 |                                  | "         |   |
| (o)              | I.         | Tr. Egr. First contact | "          | "      | 13 51 46                                 | 13 51                            | H. T.     | } |
|                  |            | Last contact,          | "          | "      | 13 51 46                                 |                                  | "         |   |
|                  |            | First contact          | "          | "      | 13 51 46                                 |                                  | "         |   |
|                  |            | Last contact,          | "          | "      | 13 51 46                                 |                                  | "         |   |

| Day of Obs.       | Satellite. | Phenomenon.            | Telescope. | Power. | Mean Solar<br>Time of<br>Observation.<br>h m s | Mean Solar<br>Time of<br>N.A.<br>h m s | Observer. |
|-------------------|------------|------------------------|------------|--------|------------------------------------------------|----------------------------------------|-----------|
| 1885, Mar. 20 (s) | III.       | Tr. Egr. First seen    | Simms' Eq. | 220    | 13 55 31                                       | 14 2                                   | "         |
|                   |            | Bisection              | "          | "      | 13 57 1                                        |                                        |           |
|                   |            | Last contact           | "          | "      | 14 0 46                                        |                                        |           |
|                   | II.        | Tr. Ing. First contact | E. Eq.     | 210    | 9 45 0                                         | 9 46                                   | A. D.     |
|                   |            | Last contact           | "          | "      | 9 51 14                                        |                                        | "         |
| 27                | I.         | First contact          | Simms' Eq. | 220    | 9 47 12                                        | 13 18                                  | L.        |
|                   |            | Last contact           | "          | "      | 9 50 37                                        |                                        | "         |
|                   |            | Tr. Ing. First contact | "          | "      | 13 16 17                                       |                                        | H. T.     |
|                   |            | Bisection              | "          | "      | 13 18 12                                       |                                        | "         |
|                   |            | Last contact           | "          | "      | 13 21 27                                       |                                        | "         |
| (o)               | III.       | First contact          | E. Eq.     | 210    | 13 14 29                                       | 13 50                                  | A. D.     |
|                   |            | Bisection              | "          | "      | 13 17 59                                       |                                        | "         |
|                   |            | Last contact           | "          | "      | 13 20 58                                       |                                        | "         |
|                   |            | Tr. Ing. First contact | Simms' Eq. | 220    | 13 46 27                                       |                                        | H. T.     |
|                   |            | Bisection              | "          | "      | 13 50 12                                       |                                        | "         |
| (t)               |            | Last contact           | "          | "      | 13 55 42                                       | 13 50                                  | "         |
|                   |            | First contact          | E. Eq.     | 210    | 13 47 9                                        |                                        | A. D.     |
|                   |            | Bisection              | "          | "      | 13 49 53                                       |                                        | "         |
|                   |            | Last contact           | "          | "      | 13 54 23                                       |                                        | "         |
|                   |            | Occ. D. First contact  | "          | "      | 10 25 1                                        |                                        | T.        |
| 28                | I.         | Bisection              | "          | "      | 10 26 31                                       | 10 25                                  | T.        |
|                   |            | Last seen              | "          | "      | 10 27 46                                       |                                        |           |

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| Day of Obs.   | Satellite. | Phenomenon.            | Telescope.    | Power. | Mean Solar Time of Observation.<br>h m s | Mean Solar Time of N.A.<br>h m s | Observer. |
|---------------|------------|------------------------|---------------|--------|------------------------------------------|----------------------------------|-----------|
| 1885, Mar. 30 | I.         | Ecl. R. First seen     | E. Eq.        | 210    | 8 1 5                                    | 8 0 54                           | H.        |
|               |            | Full brightness        | "             | "      | 8 2 59                                   |                                  |           |
|               | II.        | Tr. Ing. First contact | "             | "      | 12 4 54                                  |                                  |           |
|               |            | Last contact           | "             | "      | 12 8 59                                  |                                  |           |
|               | III.       | Ecl. R. First seen     | Lassell Refl. | 250    | 10 42 13                                 |                                  |           |
| 31 (p)        |            | Full brightness        | "             | "      | 10 48 58                                 | 10 41 50                         | W. C.     |
|               |            | First seen             | E. Eq.        | 210    | 10 42 49                                 |                                  |           |
|               |            | Full brightness        | "             | "      | 10 47 12                                 |                                  |           |
|               | I.         | Tr. Egr. First contact | Simms' Eq.    | 220    | 8 5 10                                   |                                  |           |
|               |            | Bisection              | "             | "      | 8 7 55                                   |                                  |           |
| Apr. 14       |            | Last contact           | "             | "      | 8 9 10                                   | 8 9                              | H. T.     |
|               | III.       | Occ. D. First contact  | Altaz         | 100    | 10 37 30                                 |                                  |           |
|               |            | First contact          | Simms' Eq.    | 220    | 10 39 18                                 |                                  |           |
|               | II.        | Tr. Egr. Last contact  | E. Eq.        | 210    | 9 2 48                                   |                                  |           |
|               | IV.        | Tr. Egr. First contact | "             | "      | 11 31 52                                 |                                  |           |
| 17 (o)        |            | Bisection              | "             | "      | 11 37 51                                 | 11 36                            | T.        |
|               |            | Last contact           | "             | "      | 11 42 50                                 |                                  |           |
|               | I.         | Occ. D. First contact  | Simms' Eq.    | 220    | 10 17 48                                 |                                  |           |
|               |            | Bisection              | "             | "      | 10 19 13                                 |                                  |           |
|               |            | Last seen              | "             | "      | 10 21 31                                 |                                  |           |
| 18 (v)        |            | First contact          | E. Eq.        | 210    | 10 16 57                                 | 10 19                            | L.        |
|               |            | Last seen              |               |        | 10 21 22                                 |                                  |           |
|               |            |                        |               |        |                                          |                                  |           |
|               |            |                        |               |        |                                          |                                  |           |
|               |            |                        |               |        |                                          |                                  |           |
| 20            | I.         | Occ. D. First contact  | Simms' Eq.    | 220    | 10 17 48                                 | 10 19                            | H. T.     |
|               |            | Bisection              | "             | "      | 10 19 13                                 |                                  |           |
|               |            | Last seen              | "             | "      | 10 21 31                                 |                                  |           |
|               |            | First contact          | E. Eq.        | 210    | 10 16 57                                 |                                  |           |
|               |            | Last seen              |               |        | 10 21 22                                 |                                  |           |

| Day of Obs.   | Satellite. | Phenomenon.            | Telescope.    | ower. | Mean Solar<br>Time of<br>Observation. | Mean Solar<br>Time of<br>N.A. | Observer. |
|---------------|------------|------------------------|---------------|-------|---------------------------------------|-------------------------------|-----------|
| 1885, Apr. 21 | I.         | Tr. Egr. First contact | E. Eq.        | 210   | h m s<br>9 55 59                      | h m s<br>9 59                 | H.        |
|               | IV.        | Ecl. R. First seen     | Lassell Refl. | 250   | 8 35 5                                | 8 35 43                       | A. D.     |
| 27            |            | Full brightness        | "             | "     | 8 41 43                               |                               | "         |
|               |            | First seen             | E. Eq.        | 210   | 8 35 59                               |                               | T.        |
| 29            | I.         | Ecl. R. First seen     | "             | "     | 10 8 51                               | 10 8 58                       | A. D.     |
|               |            | Full brightness        | "             | "     | 10 10 46                              |                               |           |
| May 1         | II.        | Tr. Ing. First contact | "             | "     | 11 3 35                               |                               |           |
|               |            | Bisection              | "             | "     | 11 7 14                               | 11 5                          | T.        |
| 9 (w)         | III.       | Last contact           | "             | "     | 11 10 59                              |                               |           |
|               |            | First contact          | "             | "     | 11 51 59                              |                               |           |
| 13            |            | Bisection              | "             | "     | 11 57 38                              | 11 56                         | J. P.     |
|               |            | Last contact           | "             | "     | 12 2 8                                |                               |           |
| 13            | IV.        | Occ. D. Bisection      | "             | "     | 9 55 46                               |                               | A. D.     |
|               |            | Last contact           | "             | "     | 9 59 15                               |                               | "         |
| (x)           |            | Last contact           | S.E. Eq.      | 310   | 9 57 44                               | 9 58                          | M.        |
|               |            | First contact          | Simms' Eq.    | 220   | 9 51 54                               |                               | H.        |
|               |            | Bisection              | "             | "     | 9 54 32                               |                               | "         |
|               |            | Last seen              | "             | "     | 9 58 22                               |                               | "         |

Jan. 1886.

observed at Greenwich.

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| Day of Obs.  | Satellite. | Phenomenon. | Telescope.      | Power.     | Mean Solar<br>Time of<br>Observation.<br>h m s | Mean Solar<br>Time of<br>N.A.<br>h m s | Observer. |
|--------------|------------|-------------|-----------------|------------|------------------------------------------------|----------------------------------------|-----------|
| 1885, May 13 | I.         | Occ. D.     | First contact   | E. Eq.     | 210                                            | 10 21 41                               | A. D.     |
|              |            |             | Bisection       | "          | "                                              | 10 24 11                               | "         |
|              |            |             | Last seen       | "          | "                                              | 10 26 56                               | "         |
|              |            |             | First contact   | S.E. Eq.   | 310                                            | 10 22 29                               | M.        |
|              |            |             | Bisection       | "          | "                                              | 10 25 14                               | "         |
|              |            |             | Last seen       | "          | "                                              | 10 27 39                               | "         |
|              |            |             | First contact   | Simms' Eq. | 220                                            | 10 24 13                               | H.        |
|              |            |             | Bisection       | "          | "                                              | 10 25 57                               | "         |
|              |            |             | Last seen       | "          | "                                              | 10 27 34                               | "         |
|              |            |             | First seen      | E. Eq.     | 210                                            | 10 36 51                               | A. D.     |
| (7)          | III.       | Ecl. R.     | First seen      | "          | "                                              | 10 41 8                                | "         |
|              |            |             | Full brightness | "          | "                                              | 10 36 24                               | M.        |
|              |            |             | First seen      | S.E. Eq.   | 310                                            | 10 38 9                                | "         |
|              |            |             | Bisection       | "          | "                                              | 10 39 44                               | "         |
|              |            |             | Full brightness | "          | "                                              | 10 36 53                               | H.        |
|              |            |             | First seen      | Simms' Eq. | 220                                            | 10 39 46                               | "         |
|              |            |             | Full brightness | "          | "                                              | 11 13 10                               | T.        |
|              |            | Ecl. D.     | Last seen       | E. Eq.     | 210                                            | 10 22 53                               | "         |
|              |            | Ecl. R.     | First seen      | "          | "                                              | 10 24 17                               | A. D.     |
|              |            |             | Full brightness | "          | "                                              |                                        |           |
| May 20       | III.       | Ecl. D.     | Last seen       | E. Eq.     | 210                                            | 11 10 36                               | T.        |
| 22           | I.         | Ecl. R.     | First seen      | "          | "                                              | 10 22 55                               | A. D.     |

| Day of Obs.      | Satellite. | Phaenomenon.           | Telescope.    | Power. | Mean Solar<br>Time of<br>Observation.<br>h m s | Mean Solar<br>Time of<br>N.A.<br>h m s | Observer. |
|------------------|------------|------------------------|---------------|--------|------------------------------------------------|----------------------------------------|-----------|
| 1885, May 27 (e) | III.       | Occ. D. First contact  | E. Eq.        | 210    | 9 54 15                                        | 9 57                                   | H.        |
|                  |            | Bisection              | "             | "      | 9 56 11                                        |                                        |           |
|                  |            | Last seen              | "             | "      | 9 58 1                                         |                                        |           |
| June 2 (y)       | II.        | Tr. Ing. First contact | Simms' Eq.    | 220    | 10 48 46                                       | 10 50                                  | H. T.     |
|                  |            | Bisection              | "             | "      | 10 50 1                                        |                                        | "         |
|                  |            | Last contact           | "             | "      | 10 53 36                                       |                                        | "         |
| (u)              |            | Last contact           | Lassell Refl. | 75     | 10 51 19                                       | 10 0                                   | H.        |
| 13               | I.         | Tr. Ing. First contact | Altaz         | 100    | 9 55 0                                         |                                        | A. D.     |
|                  |            | Last contact           | "             | "      | 10 0 9                                         |                                        | "         |
| (k)              |            | Last contact           | E. Eq.        | 210    | 9 59 37                                        | 16 35                                  | T.        |
| Nov. 16 (z)      | II.        | Tr. Ing. First contact | Lassell Refl. | 350    | 16 30 53                                       |                                        | H. T.     |
|                  |            | Last contact           | "             | "      | 16 35 8                                        |                                        |           |
| Dec. 28 (u)      | III.       | Ecl. D. Began to fade  | "             | "      | 14 31 9                                        | 14 31 54                               | "         |
|                  |            | Bisection              | "             | "      | 14 34 54                                       |                                        |           |
|                  |            | Last seen              | "             | "      | 14 36 24                                       |                                        |           |
| (z)              | I.         | Tr. Ing. First contact | "             | "      | 17 26 16                                       | 17 31                                  | "         |
|                  |            | Bisection              | "             | "      | 17 28 21                                       |                                        |           |
|                  |            | Last contact           | "             | "      | 17 32 56                                       |                                        |           |
|                  | III.       | Ecl. R. First seen     | "             | "      | 17 32 41                                       | 17 31 49                               | "         |
|                  |            | Full brightness        | "             | "      | 17 42 31                                       |                                        |           |

## Notes.

- (a) Very faint; cloudy.  
 (b) Bisection considered a little late.  
 (c) Observation doubtful; frost on lenses made satellite almost invisible.  
 (d) Hazy.  
 (e) Cloudy; observation uncertain.  
 (f) Satellite distinctly visible on *Jupiter's* disc 6<sup>m</sup> 15<sup>s</sup> after last contact.  
 (g) Not a very good observation. Hazy; cloud in the neighbourhood.  
 (h) Definition bad; limb boiling; observation very rough. The satellite appeared to be quite clear of the planet 1<sup>m</sup> after time of last contact.  
 (i) Definition bad; satellite clear of the planet at 8<sup>h</sup> 2<sup>m</sup>.  
 (j) Images very unsteady; definition bad. Limb of *Jupiter* very tremulous. The first phase was the best observed; the other times are rough.  
 (k) Very diffused.  
 (l) Definition fair. Satellite quite clear of the planet at 10<sup>h</sup> 44<sup>m</sup>.  
 (m) The satellite reappeared much closer to the planet than had been expected. The phenomenon was scarcely distinguishable from an occultation. The satellite was, therefore, not noticed until it had obtained some degree of brilliancy. A faint projection of the limb of the planet (as in an occultation) had been seen some little time previously, but no notice had been taken of it, as the satellite was expected to reappear some appreciable distance from the planet. The first glimpse of it would probably be about 45° to 50° earlier than the first time recorded. The second and third times are worth very little.  
 (n) Probably late, as the satellite was so very faint and near planet.  
 (o) Definition not good.  
 (p) Definition fair.  
 (q) Very tremulous.  
 (r) Cloudy.  
 (s) Definition bad; cloudy.  
 (t) First contact a little uncertain.  
 (u) Observation not considered satisfactory. Limb of planet ill-defined.  
 (v) Hazy. Planet ill-defined.  
 (w) Observation difficult. *Jupiter* very tremulous and ill-defined.  
 (x) The observer was unable to use the driving clock, and in consequence of difficulty in keeping the telescope on the planet, he missed first part of observation. Satellite IV. was distinctly seen after last contact; so also Satellite I., but less distinctly. The appearance in both cases was exactly similar to that seen in a transit, just as the satellite is wholly within the limb. The observer was not quite sure that the whole of Satellite IV. was seen, but by far the greater part was visible. That part of the limb of the satellite nearest the centre of the planet was faint and indistinct, and could not quite be traced; of Satellite I. less could be seen than of Satellite IV.  
 (y) Definition bad, planet low down.  
 (z) Definition bad.